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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,716	11/07/2005	Guenter Spahlinger	L-409	2703

7590 11/04/2009

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EXAMINER	
VLAHOS, SOPHIA	
ART UNIT	PAPER NUMBER
2611	
MAIL DATE	DELIVERY MODE
11/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Allowability	Application No.	Applicant(s)	
	10/555,716	SPAHLINGER, GUENTER	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/19/09*.

2. ☒ The allowed claim(s) is/are *32-38, 41-46,53-55, 58-63*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance:

The prior art of the record fails to teach or disclose alone or in combination: A drive circuit for a micromechanical resonator, which has at least one pulse modulator for conversion of a complex input signal to a pulsed signal, and which has: a quantization stage, which quantizes at least one of the real part and imaginary part of the control signal has been up-mixed by ω0 and thus produces the pulsed signal, with the pulsed signal which is produced by the at least one pulse modulator being used for electrostatic oscillation stimulation of a resonator , and the pulse modulator has an adder which add the first result signal from the first multiplier and the second result signal from the second multiplier to form a sum signal in order to determine the real part of the up – mixed control signal, as recited by claim 32 and in combination with other elements of the claim.

Claims 32-38, 41-46 are allowed over prior art.

The prior art of the record fails to teach or suggest alone or in combination: A method for pulse modulation of a complex input signal, characterized by the following steps: Quantization of at least one of the real part and imaginary part of the control signal, up-mixed by ω0, in order to produce a pulsed signal, with the pulsed signal being used for electrostatic oscillation stimulation of a micromechanical resonator, as recited in claim 53 and in combination with other steps of the claim.

Claims 53-55, 58-61 are allowed over prior art.

The prior art of the record fails to teach or suggest alone or in combination: A rotation rate sensor of the type that comprises a drive circuit and a micromechanical resonator, wherein said drive circuit includes at least one pulse modulator for conversion of a complex input signal to a pulsed signal for application to said resonator, said drive circuit further including: a quantization stage, which quantizes at least one of the real part and imaginary part of the control signal which has been up-mixed by $\omega 0$ and thus produces the pulsed signal, with the pulsed signal which is produced by the at least one pulse modulator and which is used for electrostatic oscillation stimulation of the micromechanical resonator, as recited in claim 62 and in combination with other elements of the claim.
Claim 62 is allowed over prior art.

The prior art of the record fails to teach or suggest alone or in combination: A method for operating a rotation rate sensor of the type which a micromechanical resonator is driven using pulse modulation of a complex input signal, characterized by the following steps: quantization of at least one of the real part and imaginary part of the control signal, up-mixed by $\omega 0$, in order to produce a pulsed signal, and using the pulsed signal for electrostatic oscillation stimulation of the micromechanical resonator, as recited by claim 63 and in combination with other steps of the claim.
Claim 63 is allowed over prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yasuda et al. (U.S. 5,841,388) discloses an A/D converter with frequency conversion stages.

Groshong (U.S. 6,218,972) discloses a tunable Bandpass sigma-delta analog-to-digital converter.

Barrett Jr. et al. (U.S. 6,275,540) discloses: a Bandpass sigma-delta analog to digital converter.

Leung (U.S. 6.064.871) discloses a low power delta sigma converter.

Khoury et al. (U.S. 6,121,910) discloses a frequency translating sigma-delta modulator.

Xu (U.S. 6,768,435)

Sindalovsky et al. (U.S. 2002/0159584) discloses an ADC converter being used to stimulate a resonator circuit.

Matthews et al. (U.S. 5,983,719) discloses a driver circuit of a rotational sensor.

Norsworthy et al. (U.S. 2004/0037363) disclose a resonant power converter driven by a digital signal output from a noise-shaping encoder.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is (571)272-5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SOPHIA VLAHOS/

Examiner, Art Unit 2611

30/10/2009

/Mohammad H Ghayour/

Supervisory Patent Examiner, Art Unit 2611